WRIGHT-PATTERSON AIR FORCE BASE, AREA B,
BUILDING 21, OLD ARMAMENT BUILDING
DAYTON VIC.
GREENE COUNTY
OHIO

HAER No. OH-79-R

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
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HISTORIC AMERICAN ENGINEERING RECORD

WRIGHT-PATTERSON AIR FORCE BASE, AREA B, BUILDING 21, OLD ARMAMENT BUILDING

HAER No. OH-79-R

Location: Southwest corner of 7th and E Streets; Wright-Patterson Air Force Base, Area B, Dayton Vicinity, Greene County, Ohio.

Date of Construction: 1929.

Present Owner: USAF.

Present Use: Maintenance support facility for the Propulsion Laboratory.

Significance: Important development of equipment designed to increase both the firepower and bombing capabilities of aircraft took place in this early Wright Field building. Building 21 has been modified extensively, but still retains some of the original structure where weapons research was performed in the 1930s.

Project History: This report is part of the overall Wright-Patterson Air Force Base, Area B documentation project conducted by HAER 1991-1993. See overview report, HAER No. OH-79, for a complete description of the project.

DESCRIPTION: The Old Armament Building is a six-course, American bond brick building with a low-pitched roof and copper entablature in the Greek Revival style. There are two bays, one facing east and the other south, each with concrete capitals on rectangular columns at the corners. Originally the building consisted of two adjacent, but perpendicular, gabled bays in the typical Wright Field style--a north section that faced north and a slightly larger southern section with gables facing east and west. In 1938 an east-facing bay was added to match the north-facing bay. The north-facing bay was demolished in 1953. In its place a large concrete addition now towers above the original portion and its slightly newer neighbor to the south. Of the present structure's 28,818 square feet, only 3566 square feet is original.

HISTORY: In 1929, two years after the dedication of Wright Field, the Air Corps Materiel Division constructed Building 21 as its Armament Laboratory. At this facility and the gun range which extended to the east, personnel developed and tested many of the weapons utilized by the Allied forces during the first half of World War II. The Armament Laboratory designed equipment to increase both the firepower and bombing capabilities of aircraft. Wright Field engineers modernized the .30 and .50 caliber machine gun systems that were most common on American aircraft during World War II. They designed cooling systems which allowed gunners to safely increase the rate of fire. This was especially important in attacks against ground targets, since the swift aircraft of World War II spent less time over their targets than previous aircraft. Gun sights and synchronizers were also improved and tested at the Armament Laboratory.

The most important advance in aircraft gunnery was the development of flexibly-mounted machine guns. The heavy .50 caliber guns also required power-mechanisms to operate their turrets effectively. With these systems, gunnery specialists on large bombers could adequately defend themselves even in the absence of fighter protection. The B-17G bomber possessed twelve .50 caliber machine guns, gaining it the nickname "Flying Fortress."

The Armament Laboratory fairly revolutionized bombing tactics with the development of improved bombsights. These specially designed devices adjusted for air speed, wind speed, altitude, bomb trajectory, and aircraft pitch and yaw. This allowed a timed release of bombs at pre-selected intervals. While such systems cannot compare with the laser-guided systems of today, they did increase the deadly effects of medium and high-altitude bombing, which were safer for pilots than the low-altitude bombing runs formerly necessary to ensure accurate bomb delivery.

An east-facing bay was added to Building 21 in 1938. However, as with other original Wright Field laboratories, Building 21 was superseded by new buildings constructed during World War II, in this case the much larger facility of Building 22, the Armament Laboratory Hangar. In 1953 the north bay was demolished and a 21,000-square-foot concrete addition was constructed on the site. Building 21 was assigned to the Propulsion Laboratory and became the engine set-up facility, assembling and preparing engines for tests in the Building 71 complex, which extends both east and west of Building 21. The addition was equipped with a ten-ton bridge crane in each of its high bays (34') and a two-ton bridge crane in each of its low bays (20'). These cranes were used to lift and carry engines and components and were retained later in the 1950s when Building 21 became known as the Fabrication Services Building. Still supporting the Propulsion Laboratory, it was used for the fabrication and assembly of test equipment and also contained four small vibration tables to test small engine components under vibrational stress. Two of the tables were mechanical, and two were electromagnetic.

Over the last several decades, Building 21 has continued its history as a general purpose maintenance shop for the Propulsion Laboratory. Today it contains maintenance support facilities for the Fuel Farm, which is adjacent to the south, and the Compressor Research Facility, located in Building 20A, which tests new compressors and fans for jet engines.

For bibliography, see Wright-Patterson Air Force Base overview report (HAER No. OH-79).